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CLAIMS

*Sub B1*  
1 A pressure actuated tip clearance system for a shroud structure of a gas turbine rotary stage including an annular plenum chamber formed between an annular arrangement of a plurality of shroud liners on the inner circumference of the chamber and a generally cylindrical casing on the radially outer side, and, in use, a hot gas stream located radially inwards of the shroud liners, wherein each shroud liner comprises a hollow box section comprising upstream and downstream walls, radially inner and outer walls, and side walls, the downstream wall and radially inner and outer walls being closed, the upstream wall having an air inlet aperture, and at least one of the side walls having at least one outlet aperture, and the inlet aperture is in flow communication with a source of high pressure air at a pressure higher than that of the hot gas stream.

*a* 2 A tip clearance system as claimed in claim 1 wherein the <sup>means for</sup> flow communication includes an aperture in a wall enclosing high pressure air, said aperture being adjacent to and in at least approximate alignment with the inlet aperture.

3 A tip clearance system as claimed in claim 1 wherein the source of high pressure air is a high pressure compressor air delivery system.

4 A tip clearance system as claimed in claim 1 wherein the at least one outlet aperture is directed into a radial gap between two adjacent shroud liners so that high pressure air within the shroud liner, in use, exits through said outlet aperture and inhibits hot gas from passing radially outwards between the shroud liners into the plenum chamber.

5 A tip clearance system as claimed in claim 1 wherein circumferentially adjacent shroud liners are linked by one or more seal strips extending across a radial gap between adjacent shroud lines, each seal strip being housed at each end in a slot in a side wall of a said shroud liner, the

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housing in the slots being arranged to permit relative radial movement of adjacent shroud liners.

a 6 ✓ A tip clearance system as claimed in claim <sup>2</sup><sub>1</sub> wherein there is provided an air transfer tube between the aperture in the wall enclosing the high pressure air and the inlet to the shroud liner, the transfer tube being arranged to move in response to radial movement of the shroud liner.

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7 ✓ A tip clearance system as claimed in claim 6 wherein the air transfer tube comprises a cylindrical structure having its upstream end inserted into the aperture in the wall enclosing the high pressure air and its downstream end inserted in the inlet to the shroud liner, the inlet to the shroud liner having a frusto-conical section tapering downstream, and the transfer tube being provided at both ends with external circumferential radiussed flanges, the upstream flange being in rolling contact with the wall of said aperture and the downstream flange being in rolling contact with the frusto-conical section of said inlet, whereby the transfer tube is able to move with several degrees of freedom in response to radial movement of the shroud liner.

Qub-B4 → 8 ✓ A tip clearance system as claimed in claim 1 wherein there is further provided a bleed aperture leading from the interior of the shroud liner to a radial clearance gap immediately upstream of the shroud liner and extending from the gas stream to the plenum chamber, whereby, in use, high pressure air from within the shroud liner exits through the bleed aperture and inhibits the passage of hot gas from the gas stream into the plenum chamber.

9 ✓ A tip clearance system as claimed in claim 8 wherein there is provided a high pressure bleed system leading from the source of high pressure air to said radial clearance gap, whereby, in use, high pressure air bleeds into the clearance gap and inhibits the passage of hot gas from the gas stream into the plenum chamber.

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- 10 ✓ A tip clearance system as claimed in claim 1 wherein there is provided a high pressure bleed system leading from the source of high pressure air to a radial clearance gap immediately upstream of the shroud liner and extending from the gas stream to the plenum chamber whereby, in use, high pressure air bleeds into the clearance gap and inhibits the passage of hot gas from the gas stream into the plenum chamber.

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